REMARKS

Claims 1, 2, 4-7 and 21-28 were pending and considered by the Examiner. Claims 21 and 22 were allowed, and claims 4, 7 and 28 were objected to, but indicated to be allowable. In response, claims 1, 5, 6, 7, 23, 24 and 25 have been amended. New claims 29, 30 and 31 have been added. Upon entry of this amendment, claims 1, 2, 4-7 and 21-31 remain pending. Reconsideration and allowance are respectfully requested.

Applicants gratefully acknowledge the Examiners indication that claims 21 and 22 are allowed, and that claims 4, 7 and 28 would be allowed if rewritten in independent form. In response, new claims 29, 30 and 31 have been added. Original claim 4 has been combined with previously presented claim 1, and submitted herein as new claim 29. Previously presented claim 7 has been combined with previously presented claim 1, and submitted herein as new claim 30. Previously presented claim 28 has been combined with previously presented claims 27 and 23, and submitted herein as new claim 31. It is respectfully submitted that claims 29, 30 and 31 are independent claims corresponding to claims 4, 7 and 28 that were indicated to be allowable. Therefore claims 29, 30 and 31 should be allowed. Reconsideration and allowance are respectfully requested.

Claims 1, 5, 6 and 23-26 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 3, 151,455 (Tennis). In response, claims 1, 5, 6 and 23, 24 and 25 have been amended. Accordingly, Applicants submit that claims 1, 5, 6 and 23-26 are now in condition for allowance, which is hereby respectfully requested.

Tennis teaches a pilot operated control valve mechanism 13 which includes a distributing or directional control valve unit 18, a combination metering and by-pass valve unit 19 and a master control or pilot valve unit 20 (column 2, lines 63-70). Pilot valve unit 20 is cooperatively

connected with control units 18 and 19 to enable an operator to manually select both the direction and speed of travel of a piston 22 in a hydraulic cylinder 10 (Fig. 1). The Examiner has specifically referred to Fig. 6, which illustrates a directional control valve mechanism 18 employed to control a pair of single acting hydraulic cylinders 151 and 152, respectively. Pilot valve units 153 and 154, metering valve unit 19 and directional control valve unit 18 are provided. Outlet 26 of pump 11 is at all times in communication with a main supply line 27 connecting with an inlet 28 in body 29 of directional control unit 18. Pump 11 is also connected with an inlet chamber 30 in body 31 of metering valve unit 19. Inlet chamber 30 of metering valve unit 19 is also in communication with pilot valve units 153 and 154. A pressure responsive metering valve member 35 is movable relative to an engaging seat member 34 to any of a number of metering positions allowing different amounts of pumped outlet fluid to bypass main supply line 27 (column 3, lines 25-33). Pilot valve units 153 and 154 are connected to metering valve unit 19 to control the position of metering valve 35 and therefore the flow through main supply line 27 to inlet 28 of directional control valve unit 18 (column 12, lines 14-46). The control spools of either pilot valve unit 153 or 154 may be shifted left of neutral to effect extension of the piston rod of its associated hydraulic cylinder 151, 152 at a rate controlled by metering valve 35. Similarly, the control spool of either pilot valve may be shifted to the right of neutral to effect retraction of the piston rod of its associated cylinder at a rate controlled by its corresponding exhaust check valve 47, 48.

In contrast to the teaching of Tennis, claim 1, as amended, recites in part:

> **a first controllable infinitely variable valve being structured and arranged to control flow between the hydraulic pressure source and the first hydraulic load and a second controllable infinitely variable valve being structured and arranged to control flow between the hydraulic pressure source and the second hydraulic load, said first and second controllable**

valves having inlets concomitantly fluidly connected to the hydraulic pressure source through a common inlet, (emphasis added).

Also in contrast to the teaching of Tennis, claim 23, as amended, recites in part:

> **... directing fluid from a pressure source to a first hydraulic load through a first controllable infinitely variable valve;**
> **communicating the directed fluid from the pressure source to a second hydraulic load through a second controllable infinitely variable valve; and**
> **controlling flow downstream of one of the first or second hydraulic loads through a third controllable infinitely variable valve ....**
> (emphasis added)

Claims 5, 6, 24 and 25 have been amended to be consistent in the use of terminology with currently amended claims 1 and 23.

Accordingly, Applicants submit that such an invention is neither taught, disclosed nor suggested by Tennis, and the present invention has distinct advantages over the prior art.

Tennis teaches a control valve mechanism in which single metering valve provides operating fluid flow to a directional control valve, each controllably operated by a pilot valve. Tennis does not teach or suggest an independent metering valve assembly comprising a first controllable infinitely variable valve controlling flow from a hydraulic press source to a first hydraulic load and a second controllable infinitely variable valve controlling flow from the hydraulic pressure source to a second load, as recited in amended claim 1. Further, Tennis does not teach or suggest a method for controlling output of a first and second hydraulic load using a common independent metering valve assembly, the method comprising directing fluid flow from a pressure source to the first hydraulic load through a first controllable infinitely variable valve, communicating fluid from the pressure source to the second hydraulic load through a second controllable infinitely variable valve and controlling flow downstream of one of the loads through a third controllable infinitely variable valve, as recited in claim 23. The hydraulic system and method of the present invention provide a greater degree of freedom in controlling multiple output

hydraulic loads using an already existing pump on an internal combustion engine and a prepackaged IMV assembly. Accordingly, Applicants respectfully submit that claim 1 together with claims 5 and 6 dependent therefrom and claims 23 together with claims 24, 25 and 26 dependent therefrom recite an invention neither taught by nor obvious from the teaching of Tennis. Reconsideration and allowance are respectfully requested.

Claims 23, 24 and 26 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 4,738,330 (Suzuki et al.). In response, claim 23 has been amended. Accordingly, applicants submit that claim 23 together with claims 24 and 26 depending therefrom, are now in condition for allowance, which is hereby respectfully requested.

Suzuki et al. teaches a hydraulic drive system for use with vehicle power steering pumps. A hydraulic pump 15 is connected to a hydraulic motor 17 and includes an output drive shaft having a cooling fan 18 connected thereto. A heat exchanger in the form of a radiator 24 is provided for cooling the engine and includes a second heat exchanger in the form of a condenser 25 for cooling air conditioning refrigerant (column 3, lines 7-25). A flow regulating valve 26 has a relief valve therein. A solenoid actuated valve 27 is provided in a bypass line B for bypassing motor 17 (column 3, lines 26-39). In a second embodiment shown in Fig. 3, a valve 126 includes a variable orifice, the opening of which is controlled in two steps by an electrically actuated solenoid 122 so that a flow rate at a first lower level or at a second higher level can be selected (column 4, lines 55-67). In a further embodiment shown in Fig. 7, an orifice bypass passage 137 is provided with a check valve 138 (column 5, lines 50-59). Fig. 10 illustrates an embodiment in which flow regulating valve 126 is replaced by a variable volume oil pump 315 controlled by a pump displacement controller 322 controlled by an ECU 30. A variable orifice 327 is designed to be controlled by a solenoid 328 controlled by ECU 30 (column 9, lines 15-26). Still other

embodiments (Figs. 11- 19) have various combinations of or substitutes for components of the aforedescribed embodiments

In contrast to the teaching of Suzuki et al., claim 23 as amended recites in part:

> ... **directing fluid from a pressure source to a first hydraulic load through a first controllable infinitely variable valve;**
> **communicating the directed fluid from the pressure source to a second hydraulic load through a second controllable infinitely variable valve; and**
> **controlling flow downstream of one of the first or second hydraulic loads through a third controllable infinitely variable valve** ....
> (emphasis added).

Claim 24 has been amended to be consistent in the use of terminology with currently amended claim 23.

Accordingly, Applicants submit that such an invention is neither taught, disclosed nor suggested by Suzuki et al, and the present invention has distinct advantages over the prior art.

Suzuki et al. teaches a hydraulic drive system which can include a variable displacement pump and various valve arrangements. However, nothing in the teaching of Suzuki et al. teaches or suggests a method of controlling output of a first hydraulic load and a second hydraulic load by directing fluid from a pressure source to the first hydraulic load through a first controllable infinitely variable valve and directing fluid from the pressure source to the second load through a second controllable infinitely variable valve. Further, nothing in the teaching of Suzuki et al teaches or suggests controlling flow downstream of one of the loads through a third controllable infinitely variable valve. The method of the present invention provides a greater degree of freedom for controlling multiple output hydraulic loads using an already existing pump on an internal combustion engine with a prepackaged IMV assembly. Accordingly, applicants submit that claim 23 together with claims 24 and 26 depending therefrom are now in condition for allowance, which is hereby respectfully requested.

Claim 1 has been rejected under 35 U.S.C. § 103(b) as being unpatentable over the teaching of U.S. Patent 3,664,129 (Schwab). In response, claim 1 has been amended. Accordingly, applicants submit that claim 1 is now in condition for allowance, which is hereby respectfully requested.

Schwab teaches a hydraulic cooling system in which a cooling fan 20 having blades 21 is rotated by a fixed displacement motor 22. Hydraulic motor 22 is supplied with pressure fluid through hoses not shown (column 2, line 70 through column 3, line 15). Figs. 4 and 5 illustrate alternative hydraulic circuits in which fixed displacement pumps and fixed displacement motors can be used. In Fig. 4, the cooling fan motor is connected in series with other hydraulic components such as a lift cylinder, tilt cylinder, etc. (column 3, lines 58-67). In Fig. 4, a fixed displacement pump 40 is driven by engine 16a and is connected in series with the other components. A thermal modulated pressure relief valve 56 is connected in parallel with fan motor 22a but in series with the other vehicle resistance elements 46. Fig. 5 illustrates a hydraulic circuit similar to Fig. 4; however, the circuit includes no downstream hydraulic components (column 8, lines 43-59). Fig. 6 illustrates an embodiment in which a suction line 120 feeding from a sump 121 to a variable displacement pump 122 is driven by an internal combustion engine 16c. A thermal modulated pressure reducing valve 134 is connected to a variable pressure spring 140 controlled by a thermal element 136. Fig. 7 illustrates an embodiment similar to that of Fig. 6 but with components connected in parallel.

In contrast to the teaching of Schwab, claim 1 as amended recites in part:

> **a first controllable infinitely variable valve being structured and arranged to control flow between the hydraulic pressure source and the first hydraulic load and a second controllable infinitely variable valve being structured and arranged to control flow between the hydraulic pressure source and the second hydraulic load, said first and second controllable**

valves <u>having inlets concomitantly fluidly connected</u> to the hydraulic pressure source <u>through a common inlet</u>, (emphasis added)

Accordingly, Applicants submit that such an invention is neither taught, disclosed nor suggested by Schwab, and the present invention has distinct advantages over the prior art.

Schwab does not teach or suggest an independent metering valve assembly comprising a first controllable infinitely variable valve controlling flow from a hydraulic press source to a first hydraulic load and a second controllable infinitely variable valve controlling flow from the hydraulic pressure source to a second load, as recited in amended claim 1. The present invention provides a greater degree of freedom for controlling multiple output hydraulic loads using an already existing pump on an internal combustion engine with a prepackaged IMV assembly. Accordingly, applicants submit that claim 1 is now in condition for allowance, which is hereby respectfully requested.

Claim 2 has been rejected under 35 U.S.C. § 103 as being unpatentable over Schwab in view of U.S. Patent 6,314,729 (Crull et al). Claim 2 depends from claim 1 which is believed to be allowable for the reasons stated above. Claim 2 includes all of the limitations of claim 1. Therefore, it is respectfully submitted that claim 2 is allowable together with independent claim 1, for the reasons above.

Claim 27 has been rejected under 35 U.S.C. § 103 as being unpatentable over Suzuki et al. in view of Crull et al. Claim 27 depends from claim 23, which is believed to be allowable for the reasons stated above. Claim 27 includes all of the limitations of claim 23. Therefore, it is respectfully submitted that claim 27 is allowable together with claim 23, for the reasons stated above.

For the foregoing reasons, Applicants submit that no combination of the cited references teaches, discloses or suggests the subject matter of the amended claims. The pending claims are therefore in condition for allowance, and Applicants respectfully request withdrawal of all rejections and allowance of the claims.

In the event Applicants have overlooked the need for an extension of time, an additional extension of time, payment of fee, or additional payment of fee, Applicants hereby conditionally petition therefor and authorize that any charges be made to Deposit Account No. 20-0095, TAYLOR & AUST, P.C.

Should any question concerning any of the foregoing arise, the Examiner is invited to telephone the undersigned at (260) 897-3400.

Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on: February 3, 2004.

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February 3, 2004
Date